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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	124.926	251.251	274.371	0.000	274.371	171.766	169.366	166.074	167.915	Continuing	Continuing
3186: <i>Air and Missile Defense Radar</i>	92.998	189.078	228.436	0.000	228.436	123.053	132.390	141.771	141.608	Continuing	Continuing
3187: <i>Periscope Detection</i>	7.338	7.207	3.374	0.000	3.374	8.306	0.000	0.000	0.000	0.000	40.958
3188: <i>Dual-Band Radar</i>	5.443	5.673	5.419	0.000	5.419	4.739	5.589	5.638	5.796	Continuing	Continuing
3232: <i>Multi-Mission Signal Processor</i>	0.000	32.961	32.607	0.000	32.607	30.948	27.806	16.500	19.476	Continuing	Continuing
3301: <i>Improved Capabilities SPY-1 Radar</i>	0.000	0.000	4.535	0.000	4.535	4.720	3.581	2.165	1.035	Continuing	Continuing
9999: <i>Congressional Adds</i>	19.147	16.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.479

A. Mission Description and Budget Item Justification

A. MISSION DESCRIPTION:

Air and Missile Defense Radar (AMDR): The AMDR suite is being developed to fulfill Integrated Air and Missile Defense requirements for multiple ship classes. This suite consists of an S-Band radar (AMDR-S), an X-band radar (AMDR-X) and a Radar Suite Controller (RSC). AMDR will provide multi-mission capabilities, simultaneously supporting both long range, exoatmospheric detection, tracking and discrimination of ballistic missiles, as well as Area and Self Defense against air and surface threats. For the Ballistic Missile Defense capability, increased radar sensitivity and bandwidth over current radar systems are needed to detect, track and support engagements of advanced ballistic missile threats at the required ranges, concurrent with Area and Self Defense against Air and Surface threats. For the Area Air Defense and Self Defense capability, increased sensitivity and clutter capability is needed to detect, react to, and engage stressing Very Low Observable/Very Low Flyer (VLO/VLF) threats in the presence of heavy land, sea, and rain clutter. This effort and material provide for the development of an active phased array radar with the required capabilities to address the evolving threat. Modularity of hardware and software, a designed in-growth path for technology insertion, and Open Architecture (OA) compliance are required for performance and technology enhancements throughout service life.

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<p>Periscope Detection: The CVN Periscope Detection Radar program develops and delivers a radar that provides automatic detection and discrimination of submarine periscopes using advanced algorithms enabling discrimination of periscopes from surface contacts, buoys, small boats, floating mines, etc. This effort is based on an advanced development model, developed in the PE 0603553N Antisubmarine Warfare. System Engineering efforts under RDT&E funding will convert the Advanced Demonstration Model (ADM) variant previously developed and being installed to a production representative model that addresses manufacturability, supportability and reliability aspects as well as full system certification.</p> <p>Dual-Band Radar (DBR) Upgrades: The DBR Upgrades will fund Dual Band Radar (DBR) System upgrades and Volume Search Radar Enhancement. The DBR Upgrades will fund future upgrades/technology insertion efforts for Multi-Function Radar (MFR)/Volume Search Radar (VSR)/Dual Band Radar (DBR) suite on DDG1000 Class and CVN 78 Class ships. Upgrades and technology inserts are required to maintain the level of force protection needed for ship defense against all threats envisioned in the littoral environment. The upgrades will include all aspects of the radar system/subsystems, including hardware and software. Specific subsystem areas include the Array, Transmit/Receive (T/R) module, Receiver/Exciter, Signal Data Processor, Radome, and power/cooling systems. The Volume Search Radar (VSR) enhancement was initiated in PR11 to implement configuration upgrades to provide improved performance against emerging threats through spiral development for integration into additional ship platforms. Initial Operational Capability (IOC) and specific technical requirements will be documented in accordance with Joint Capability Integrated Development (JCIDS) in a Capability Development Document (CDD).</p> <p>Multi-Mission Signal Processor: Multi-Mission Signal Processor (MMSP) provides AAW/BMD Multi-mission capability for DDG 51-78 as part of DDG Modernization Program. Modifies SPY-1D Transmitter to enable dual beam for reduced frame times and better reaction time, and provides stability for all D(V) waveforms and avoid operational degradation. It improves performance in littoral, ducted clutter environments. Detects, tracks and support engagements of a broader range of threats. MMSP provides reduced environmental effects, and better track continuity on small threats in land clutter. Improves performance in electronic attack (EA) and chaff environments and provides greater commonality in computer programs and equipment.</p> <p>Improved Capabilities for SPY-1 Radar: These Reliability, Maintainability, and Availability (RM&A) improvements are intended to reduce Casualty Reports (CASREPs) and cascading failures, mitigate obsolescence issues, and improve reliability in support of Anti-Air Warfare (AAW) and Ballistic Missile Defense (BMD) missions; while still providing AN/SPY-1 Radar Total Ownership Cost Reductions. Currently fielded AN/SPY-1 transmitter systems have an annual replacement part cost of approximately \$19M. Other O&S costs add an additional \$16M per year, for a total approximate annual cost of \$35M.</p>		

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B. Program Change Summary (\$ in Millions)

	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011 Base</u>	<u>FY 2011 OCO</u>	<u>FY 2011 Total</u>
Previous President's Budget	138.546	236.078	0.000	0.000	0.000
Current President's Budget	124.926	251.251	274.371	0.000	274.371
Total Adjustments	-13.620	15.173	274.371	0.000	274.371
• Congressional General Reductions		-1.047			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	-0.180			
• Congressional Adds		16.400			
• Congressional Directed Transfers		0.000			
• Reprogrammings	-9.999	0.000			
• SBIR/STTR Transfer	-3.621	0.000			
• Program Adjustments	0.000	0.000	274.371	0.000	274.371

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *Common Digital Sensor Architecture*

Congressional Add: *Submarine Navigation Decision Aids*

Congressional Add: *Common Below Decks Affordable Architecture*

Congressional Add: *National Radio Frequency R&D and Tech Transfer Cen*

Congressional Add: *Advanced Sensor Development*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	<u>FY 2009</u>	<u>FY 2010</u>
	0.000	2.390
	0.000	3.983
	3.191	0.000
	3.989	0.000
	11.967	9.959
	19.147	16.332
	19.147	16.332

Change Summary Explanation

This PE was established for the FY2008 President's Budget. Previous Budget Submissions were PE 0604307N AEGIS Combat System Engineering - project 3044/Solid State Spy Radar and PE 0603513N/Shipboard System Component Development - project 4019/Radar Upgrades.

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Technical: Not applicable.

Schedule: As a result of delays with finalizing the radar hull study, the completion of the AMDR technology development phase has been shifted from FY12 to FY13.

Increase in FY10 due to Congressional Adds for Common Digital Sensor Architecture, Submarine Navigation Decision Aids, and Advanced Sensor Development.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3186: <i>Air and Missile Defense Radar</i>	92.998	189.078	228.436	0.000	228.436	123.053	132.390	141.771	141.608	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Air and Missile Defense Radar (AMDR): The AMDR suite is being developed to fulfill Integrated Air and Missile Defense requirements for multiple ship classes. This suite consists of an S-Band radar (AMDR-S), an X-band radar (AMDR-X) and a Radar Suite Controller (RSC). AMDR will provide multi-mission capabilities, simultaneously supporting both long range, exoatmospheric detection, tracking and discrimination of ballistic missiles, as well as Area and Self Defense against air and surface threats. For the Ballistic Missile Defense (BMD) capability, increased radar sensitivity and bandwidth over current radar systems are needed to detect, track and support engagements of advanced ballistic missile threats at the required ranges, concurrent with Area and Self Defense against Air and Surface threats. For the Area Air Defense and Self Defense capability, increased sensitivity and clutter capability is needed to detect, react to, and engage stressing Very Low Observable /Very Low Flyer (VLO/VLF) threats in the presence of heavy land, sea, and rain clutter. This effort and material provide for the development of an active phased array radar with the required capabilities to address the evolving threat. Modularity of hardware and software, a designed in-growth path for technology insertion, and Open Architecture (OA) compliance are required for performance and technology enhancements throughout service life.

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
R&D/RISK REDUCTION	22.334	16.954	12.960	0.000	12.960
<i>FY 2009 Accomplishments:</i> <ul style="list-style-type: none"> - High Voltage (HV) GaAs Field Effect Transistor (FET) technology producibility - Technology Risk reduction of Digital Array Radar (DAR) / digital beamforming, array architectures, Transmit/Receive (T/R) modules, thermal management, and Radio Frequency (RF) semiconductors - Critical component and subsystem demonstrations, integration and testing 					

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B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<i>FY 2011 Base Plans:</i> - Cost, schedule and performance management, contract administration and oversight, risk identification and mitigation - Analyze and assess contractor studies - Review available/proposed technical alternatives								
DAWDF <i>FY 2009 Accomplishments:</i> - Funds are for the Acquisition Workforce Fund-2009				0.513	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals				92.998	189.078	228.436	0.000	228.436
C. Other Program Funding Summary (\$ in Millions)								
N/A								
D. Acquisition Strategy								
AMDR: Plans for the Air and Missile Defense Radar are to leverage research and development investments, integrate sufficiently matured fundamental advanced technologies from technology risk reduction efforts, and incorporate Open Architecture approaches to develop a scalable radar design with major improvements in power, sensitivity, resistance to natural and man-made environments over current radar systems for simultaneous multi-mission (BMD), Area and Self Defense Anti-Air Warfare (AAW). System design will be accomplished by employing proven technologies and commercial standards to lower schedule risk and develop a product with the lowest life-cycle cost. Program scope includes a Concept Studies phase; a Technology Development phase which includes demonstration of a pilot prototype by up to 3 contractors, completion of a full Engineering Development Model (EDM) for land-based testing; and transition to production. Program efforts reflect the approved acquisition strategy contained in the Technology Development Strategy (TDS) for the AMDR suite system concept.								
E. Performance Metrics								
- Successfully complete Defense Acquisition Board (DAB) Review - Successfully complete AMDR Concept Studies - Successfully achieve Milestone A								

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<ul style="list-style-type: none">- Successfully complete Technology Development (TD) phase Test Readiness Review, TD Prototype testing, TD System Functional Review, and TD Preliminary Design Review- Successfully achieve Milestone B- Begin Engineering & Manufacturing Development (EMD) and successfully complete EMD Critical Design Review and EDM Testing		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy										DATE: February 2010			
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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Risk Reduction	WR	SCSC Wallops Wallops Island, VA	2.652	4.239	Dec 2009	1.320	Dec 2010	0.000		1.320	Continuing	Continuing	Continuing
Risk Reduction	MIPR	DMEA McClellan AFB, CA	41.913	5.800	Dec 2009	2.530	Dec 2010	0.000		2.530	Continuing	Continuing	Continuing
Risk Reduction	SS/CPFF	JHU/APL Baltimore, MD	2.405	2.215	Dec 2009	2.215	Dec 2010	0.000		2.215	Continuing	Continuing	Continuing
Risk Reduction	MIPR	MIT Cambridge, MA	1.240	0.550	Dec 2009	0.550	Dec 2010	0.000		0.550	Continuing	Continuing	Continuing
Risk Reduction	WR	NRL Washington, DC	5.145	0.657	Dec 2009	0.484	Dec 2010	0.000		0.484	Continuing	Continuing	Continuing
Risk Reduction	SS/Various	BAE Systems Rockville, MD	1.849	0.382	Dec 2009	0.000		0.000		0.000	0.000	2.231	Continuing
Risk Reduction	WR	NAVFAC MID-ATLANTIC Pearl Harbor, HI	3.991	0.000		0.000		0.000		0.000	0.000	3.991	Continuing
Risk Reduction	Various/TBD	TBD-PSS TBD	0.000	1.147	Feb 2010	1.148	Dec 2010	0.000		1.148	Continuing	Continuing	Continuing
Risk Reduction	WR	NSWC/DD Dahlgren, VA	1.912	1.964	Dec 2009	1.964	Dec 2010	0.000		1.964	Continuing	Continuing	Continuing
Risk Reduction	MIPR	DARPA Adelphi, MD	4.500	0.000		2.750	Dec 2010	0.000		2.750	Continuing	Continuing	Continuing
Systems Engineering	SS/CPFF	GTRI Atlanta, GA	1.731	1.302	Dec 2009	1.475	Dec 2010	0.000		1.475	Continuing	Continuing	Continuing
Systems Engineering	SS/FFP	BAE Systems	9.536	0.855	Dec 2009	0.000		0.000		0.000	0.000	10.391	Continuing

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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Rockville, MD											
Systems Engineering	Various/ TBD	VARIOUS-SPECIAL Special	3.078	0.000		0.000		0.000		0.000	0.000	3.078	Continuing
Systems Engineering	WR	NSWC/DD Dahlgren, VA	23.054	9.606	Dec 2009	10.895	Dec 2010	0.000		10.895	Continuing	Continuing	Continuing
Systems Engineering	WR	PMRF Kekaha, HI	0.369	0.417	Dec 2009	0.417	Dec 2010	0.000		0.417	Continuing	Continuing	Continuing
Systems Engineering	SS/CPFF	JHU/APL Baltimore, MD	21.735	9.770	Dec 2009	12.831	Dec 2010	0.000		12.831	Continuing	Continuing	Continuing
Systems Engineering	MIPR	MIT Cambridge, MA	5.429	2.720	Dec 2009	3.551	Dec 2010	0.000		3.551	Continuing	Continuing	Continuing
Systems Engineering	WR	NSW/PHD Port Hueneme, CA	2.994	1.378	Dec 2009	1.561	Dec 2010	0.000		1.561	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/CR Crane, IN	1.046	0.547	Dec 2009	0.620	Dec 2010	0.000		0.620	Continuing	Continuing	Continuing
Systems Engineering	WR	NRL Washington, DC	2.093	1.255	Dec 2009	2.166	Dec 2010	0.000		2.166	Continuing	Continuing	Continuing
Systems Engineering	Various/ TBD	TBD-PSS TBD	0.000	2.564	Feb 2010	4.344	Dec 2010	0.000		4.344	Continuing	Continuing	Continuing
Systems Engineering	C/FPI	TBD-Tech. Development Phase TBD	0.000	113.594	Jun 2010	145.308	Nov 2010	0.000		145.308	Continuing	Continuing	Continuing
Systems Engineering			0.000	0.000		6.050	Dec 2010	0.000		6.050	Continuing	Continuing	Continuing

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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
	Various/ TBD	TBD-Test and Evaluation TBD											
Systems Engineering	C/FFP	CS-Northrop Grumman Linthicum Heights, MD	10.000	0.000		0.000		0.000		0.000	0.000	10.000	Continuing
Systems Engineering	C/FFP	CS-Lockheed Martin Moorestown, NJ	10.000	0.000		0.000		0.000		0.000	0.000	10.000	Continuing
Systems Engineering	C/FFP	CS-Raytheon Sudbury, MA	9.909	0.000		0.000		0.000		0.000	0.000	9.909	Continuing
Subtotal			166.581	160.962		202.179		0.000		202.179			

Remarks

Management Services (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Support Management Services	SS/FFP	BAE Systems Rockville, MD	5.319	1.217	Dec 2009	0.000		0.000		0.000	0.000	6.536	Continuing
		Various	19.657	25.096	Nov 2009	22.839	Nov 2010	0.000		22.839	Continuing	Continuing	Continuing

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Management Services (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Support Management Services	Various/ Various	Various											
Support Management Services	C/CPIF	TBD-PSS TBD	0.000	1.703	Dec 2009	3.308	Dec 2010	0.000		3.308	Continuing	Continuing	Continuing
Travel	Allot	PEOIS2 Washington, DC	0.200	0.100	Nov 2009	0.110	Nov 2010	0.000		0.110	Continuing	Continuing	Continuing
DAWDF	Various/ Various	N/A N/A	0.513	0.000		0.000		0.000		0.000	0.000	0.513	Continuing
Subtotal			25.689	28.116		26.257		0.000		26.257			

Remarks

Project Cost Totals	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	192.270	189.078		228.436		0.000		228.436			

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

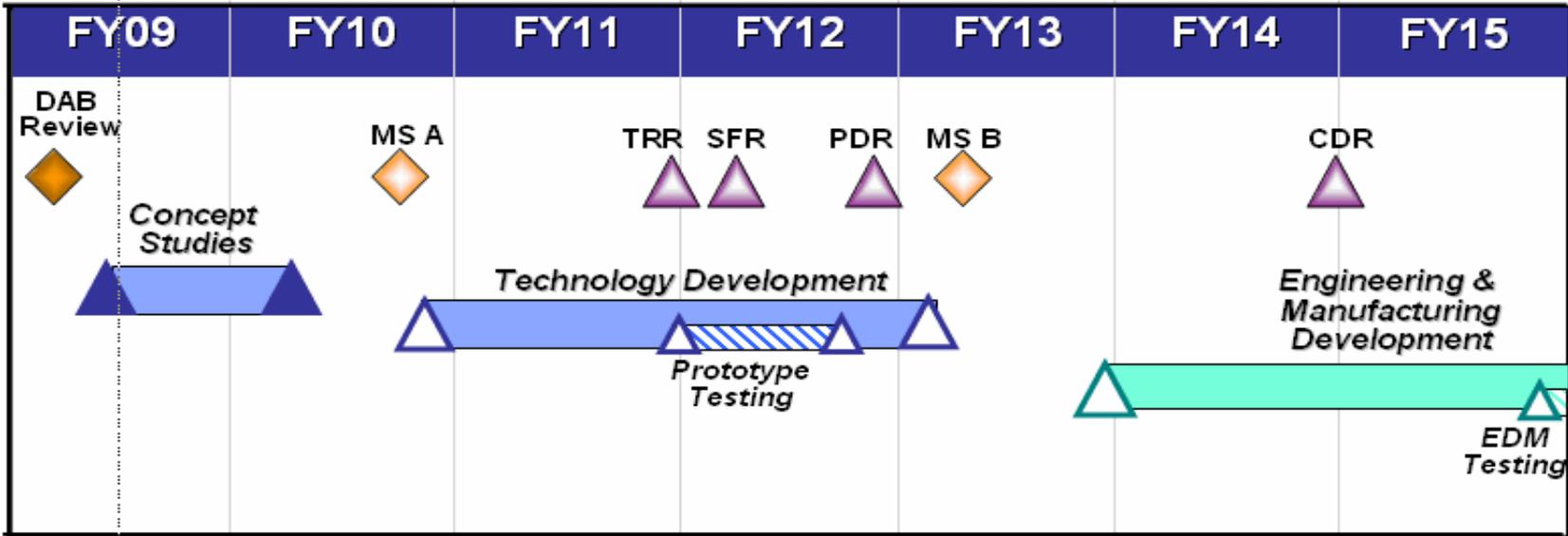
1319: *Research, Development, Test & Evaluation, Navy*
 BA 5: *Development & Demonstration (SDD)*

R-1 ITEM NOMENCLATURE

PE 0604501N: *Advanced Above Water Sensors*

PROJECT

3186: *Air and Missile Defense Radar*



CDR	Critical Design Review
DAB	Defense Acquisition Board
EDM	Engineering Development Model
MS	Milestone
PDR	Preliminary Design Review
SFR	System Functional Review
TRR	Test Readiness Review

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy		DATE: February 2010
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Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Defense Acquisition Board (DAB) Review	1	2009	1	2009
Concept Studies (CS)	2	2009	2	2010
Milestone A (MS A)	3	2010	3	2010
Technology Development (TD)	3	2010	1	2013
TD Test Readiness Review (TRR)	4	2011	4	2011
TD Prototype Testing	4	2011	3	2012
TD System Functional Review (SFR)	2	2012	2	2012
TD Preliminary Design Review (PDR)	4	2012	4	2012
Milestone B (MS B)	2	2013	2	2013
Engineering & Manufacturing Development (EMD)	4	2013	4	2015
EMD Critical Design Review (CDR)	4	2014	4	2014
EMD Engineering Development Model (EDM) Testing	4	2015	4	2015

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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3187: <i>Periscope Detection</i>	7.338	7.207	3.374	0.000	3.374	8.306	0.000	0.000	0.000	0.000	40.958
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The CVN Periscope Detection Radar program develops and delivers a radar that provides semi-automatic detection and discrimination of submarine periscopes using advanced algorithms enabling discrimination of periscopes from surface contacts, buoys, small boats, floating mines, etc. This effort is based on an advanced development model, developed in the PE 0603553N, Surface Antisubmarine Warfare. System Engineering efforts under RDT&E funding will convert the Advanced Demonstration Model (ADM) variant previously developed and being installed to a production representative model that addresses manufacturability, supportability and reliability aspects as well as full system certification.

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Periscope Detection <i>FY 2009 Accomplishments:</i> - Design an ADM using established capabilities from previous radars (Algorithms utilized by Automatic Radar Periscope - Detection Discrimination (ARPDD), technology based in part on the AN/SPQ-9B Anti-Ship Cruise Missile (ASCM) Radar) with modern computing advances in processing capability being inserted into the system using an Open Architecture approach <i>FY 2010 Plans:</i> - Design an ADM using established capabilities from previous radars (Algorithms utilized by Automatic Radar Periscope - Detection Discrimination (ARPDD), technology based in part on the AN/SPQ-9B Anti-Ship Cruise Missile (ASCM) Radar) with modern computing advances in processing capability being inserted into the system using an Open Architecture approach - Install ADM on platform(s)	7.302	7.207	3.374	0.000	3.374

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3187: <i>Periscope Detection</i>
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B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<p><i>FY 2011 Base Plans:</i></p> <ul style="list-style-type: none"> - Design an ADM using established capabilities from previous radars (Algorithms utilized by Automatic Radar Periscope - Detection Discrimination (ARPDD), technology based in part on the AN/SPQ-9B Anti-Ship Cruise Missile (ASCM) Radar) with modern computing advances in processing capability being inserted into the system using an Open Architecture approach - Perform test and evaluation 					
<p>DAWDF</p> <p><i>FY 2009 Accomplishments:</i></p> <ul style="list-style-type: none"> - Funds are for the Acquisition Workforce Fund-2009. 	0.036	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	7.338	7.207	3.374	0.000	3.374

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011 Base</u>	<u>FY 2011 OCO</u>	<u>FY 2011 Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PE/LI: 0204228N/2040 Radar Support (OPN)	13.612	13.128	12.030	0.000	12.030	25.591	15.646	14.065	5.557	Continuing	Continuing

D. Acquisition Strategy

Periscope Detection: Current Program scope is for 11 total units - 10 for installation onboard CVNs and 1 at a to be determined shore site. Of these 11 units, 4 will be Advanced Demonstration Models (ADMs) and 7 will be Production Model units. Funding for 4 of the units will come from R&D (ADMs) in FY 06, FY 07 and FY 08 procurements, and 7 will be funded using OPN. The current proposed plan is for all units to be awarded sole source to Northrop Grumman Corporation (NGC) and 3 Phoenix Corporation. NGC will be responsible for the antenna, transmitter, and receiver. 3 Phoenix will be responsible for the processor for all 11 RDC units. Funding is also to be used to procure and install back-fit hardware/software to bring the first four ADM variants to production configuration.

E. Performance Metrics

- Successfully develop the Advanced Demonstration Model (ADM)

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3187: <i>Periscope Detection</i>
<ul style="list-style-type: none">- Successfully complete AUTECH Testing- Successfully complete At Sea Testing- Successfully complete TECHEVAL/OPEVAL- Successfully complete AEGIS Weapon System PDD Interface Development for SPS-74 or SPQ-9B		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3187: <i>Periscope Detection</i>
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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering	SS/CPFF	NGC Linthicum Heights, MD	12.639	2.325	Dec 2009	0.000		0.000		0.000	0.000	14.964	Continuing
System Installation	Various/TBD	Various Various	8.870	4.482	Dec 2009	3.168	Dec 2010	0.000		3.168	Continuing	Continuing	Continuing
Subtotal			21.509	6.807		3.168		0.000		3.168			

Remarks

Test and Evaluation (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	WR	NSWC PHD Port Hueneme, CA	0.490	0.200	Dec 2009	0.150	Dec 2010	0.000		0.150	Continuing	Continuing	Continuing
Test and Evaluation	WR	OPTEVFOR Norfolk, VA	0.000	0.200	Dec 2009	0.056	Dec 2010	0.000		0.056	Continuing	Continuing	Continuing
Subtotal			0.490	0.400		0.206		0.000		0.206			

Remarks

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3187: <i>Periscope Detection</i>
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Management Services (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total		Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date			
DAWDF	Allot	N/A N/A	0.036	0.000		0.000		0.000		0.000	0.000	0.036		Continuing
Subtotal			0.036	0.000		0.000		0.000		0.000	0.000	0.036		

Remarks

Project Cost Totals	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.035	7.207		3.374		0.000		3.374			

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3187: <i>Periscope Detection</i>
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Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Advanced Demonstration Model (ADM)	1	2009	4	2010
Production	3	2009	4	2015
Software Support	1	2009	4	2015
Land Based Testing (AUTEK)	1	2009	2	2009
At Sea Testing	2	2009	3	2009
TECHEVAL/OPEVAL	2	2012	3	2012
AEGIS Weapon System PDD Interface Development for SPS-74 or SPQ-9B	1	2012	1	2012

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>				PROJECT 3188: <i>Dual-Band Radar</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3188: <i>Dual-Band Radar</i>	5.443	5.673	5.419	0.000	5.419	4.739	5.589	5.638	5.796	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification											
Dual-Band Radar (DBR) Upgrades: The DBR Upgrades will fund Dual Band Radar (DBR) System upgrades and Volume Search Radar Enhancement. The DBR Upgrades will fund future upgrades/technology insertion efforts for Multi-Function Radar (MFR)/Volume Search Radar (VSR)/Dual Band Radar (DBR) suite on DDG1000 Class and CVN 78 Class ships. Upgrades and technology inserts are required to maintain the level of force protection needed for ship defense against all threats envisioned in the littoral environment. The upgrades will include all aspects of the radar system/subsystems, including hardware and software. Specific subsystem areas include the Array, Transmit/Receive (T/R) module, Receiver/Exciter, Signal Data Processor, Radome, and power/cooling systems.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
RADAR UPGRADES TECHNOLOGY INSERTION							3.000	3.000	3.000	0.000	3.000
<i>FY 2009 Accomplishments:</i> - Technology Insertion for the MFR/VSR/DBR hardware and software											
<i>FY 2010 Plans:</i> - Technology Insertion for the MFR/VSR/DBR hardware and software											
<i>FY 2011 Base Plans:</i> - Technology Insertion for the MFR/VSR/DBR hardware and software											
RADAR UPGRADES GOVERNMENT ENGINEERING SERVICES							2.216	2.473	2.219	0.000	2.219

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3188: <i>Dual-Band Radar</i>				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<p><i>FY 2009 Accomplishments:</i></p> <ul style="list-style-type: none"> - Government Engineering Services and Program Management support for radar upgrades and technology insertion of the MFR/VSR/DBR radars. Perform oversight and assessment of efforts associated with this phase of the program. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Government Engineering Services and Program Management support for radar upgrades and technology insertion of the MFR/VSR/DBR radars. Perform oversight and assessment of efforts associated with this phase of the program. <p><i>FY 2011 Base Plans:</i></p> <ul style="list-style-type: none"> - Government Engineering Services and Program Management support for radar upgrades and technology insertion of the MFR/VSR/DBR radars. Perform oversight and assessment of efforts associated with this phase of the program. 						
<p>RADAR UPGRADES PROGRAM MANAGEMENT</p> <p><i>FY 2009 Accomplishments:</i></p> <ul style="list-style-type: none"> - Provide Program Management in support of radar upgrades and technology insertion <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Provide Program Management in support of radar upgrades and technology insertion <p><i>FY 2011 Base Plans:</i></p> <ul style="list-style-type: none"> - Provide Program Management in support of radar upgrades and technology insertion 		0.200	0.200	0.200	0.000	0.200
<p>DAWDF</p> <p><i>FY 2009 Accomplishments:</i></p> <ul style="list-style-type: none"> - Funds are for the Acquisition Workforce Fund-2009. 		0.027	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>		R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>		PROJECT 3188: <i>Dual-Band Radar</i>				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Accomplishments/Planned Programs Subtotals				5.443	5.673	5.419	0.000	5.419
C. Other Program Funding Summary (\$ in Millions) N/A								
D. Acquisition Strategy Radar Upgrades will be developed to address lessons learned and technology refresh for DBR systems on multiple ship classes.								
E. Performance Metrics - Successfully complete upgrade studies and analyses - Successfully complete upgrade technology insertion								

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3188: <i>Dual-Band Radar</i>
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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Engineering Support	WR	Other Government Activities Not Specified	0.656	0.498	Dec 2009	0.144	Dec 2010	0.000		0.144	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/Dahlgren Dahlgren, VA	1.180	0.600	Dec 2009	0.625	Dec 2010	0.000		0.625	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/PHD Port Hueneme, CA	1.170	0.475	Dec 2009	0.500	Dec 2010	0.000		0.500	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/Crane Crane, IN	3.500	0.225	Dec 2009	0.250	Dec 2010	0.000		0.250	Continuing	Continuing	Continuing
Government Engineering Support	WR	NRL Washington, DC	3.500	0.225	Dec 2009	0.250	Dec 2010	0.000		0.250	Continuing	Continuing	Continuing
Government Engineering Support	C/CPFF	JHU/APL Baltimore, MD	0.140	0.100	Feb 2010	0.100	Feb 2011	0.000		0.100	Continuing	Continuing	Continuing
Government Engineering Support	MIPR	NSMA Arlington, VA	0.600	0.300	Feb 2010	0.300	Feb 2011	0.000		0.300	Continuing	Continuing	Continuing
Government Engineering Support	C/CPFF	GTRI Atlanta, GA	0.100	0.050	Feb 2010	0.050	Feb 2011	0.000		0.050	Continuing	Continuing	Continuing
Systems Engineering	C/TBD	Raytheon C/CPAF	6.140	3.000	Feb 2010	3.000	Feb 2011	0.000		3.000	Continuing	Continuing	Continuing
Subtotal			16.986	5.473		5.219		0.000		5.219			

Remarks

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3188: <i>Dual-Band Radar</i>
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Management Services (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Support	C/TBD	Various C/CPFF	0.200	0.200	Dec 2009	0.200	Dec 2010	0.000		0.200	Continuing	Continuing	Continuing
DAWDF	Allot	N/A N/A	0.027	0.000		0.000		0.000		0.000	0.000	0.027	Continuing
Subtotal			0.227	0.200		0.200		0.000		0.200			

Remarks

Project Cost Totals	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
	17.213	5.673		5.419		0.000		5.419			

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3188: <i>Dual-Band Radar</i>
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Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
DBR System Upgrade Studies and Analysis	1	2009	3	2015
DBR System Upgrade Technology Insertion	3	2009	4	2015

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>				PROJECT 3232: <i>Multi-Mission Signal Processor</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3232: <i>Multi-Mission Signal Processor</i>	0.000	32.961	32.607	0.000	32.607	30.948	27.806	16.500	19.476	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification											
<p>Multi-Mission Signal Processor (MMSP) provides Anti-Air Warfare (AAW)/Ballistic Missile Defense (BMD) Multi-mission capability for DDG 51-78 as part of DDG Modernization Program. Modifies SPY-1D Transmitter to enable dual beam for reduced frame times and better reaction time, and provides stability for all D(V) waveforms and avoid operational degradation. It improves performance in littoral, ducted clutter environments. Detects, tracks and supports engagements of a broader range of threats. MMSP provides reduced environmental effects, and better track continuity on small threats in land clutter. Improves performance in electronic attack (EA) and chaff environments and provides greater commonality in computer programs and equipment.</p> <p>Multi-Mission Signal Processor FY 10 and outyear funding for Cruisers/Destroyers was transferred from 0604307N/1447 to 0604501N/3232.</p>											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SYSTEMS ENGINEERING							0.000	32.961	32.607	0.000	32.607
<p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Finalize requirements definition and alignment with the Ballistic Missile Defense Program for incorporation of the BMD capability - Support Initial Capability Demonstration at Combat System Engineering Development Site (CSEDS) - Production Readiness Review in 3rd Quarter of FY10 - Maintain alignment with the Ballistic Missile Defense program and the associated Ballistic Missile Defense Signal Processor (BSP) Adjunct to incorporate BMD capability within MMSP during AEGIS Modernization. 											

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3232: <i>Multi-Mission Signal Processor</i>
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B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
<p><i>FY 2011 Base Plans:</i> FY11 Plan: Support MMSP development and integration testing with ACB-12. Conduct testing ashore in an integrated combat systems environment for two formal events at Combat Systems Engineering Development Site of increasing complexity air defense and multi-mission (air and ballistic missile defense) technical performance demonstrations leading to an integrated combat system level demonstration event.</p> <ul style="list-style-type: none"> - Support MMSP installation and integration with AN/SPY-1D at Wallops Island Test Facility, measure and characterize actual performance versus requirements, and conduct system-level testing. - Continue software development, incorporate BMD and fault-detection functionality, resolve and fix developmental software to achieve a Quality Assurance version. - Produce and update MMSP specifications, design documentation, and test reports. - Create and update MMSP documentation (e.g. technical manuals, training curriculum, logistics support, etc). - Deliver Technical Data Package (Drawings) revisions for MMSP Hardware. 					
Accomplishments/Planned Programs Subtotals	0.000	32.961	32.607	0.000	32.607

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011 Base</u>	<u>FY 2011 OCO</u>	<u>FY 2011 Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PE/LI: <i>BLI 2980/OPN Items Less Than \$5M</i>	0.200	18.000	0.000	0.000	0.000	0.030	0.000	0.000	0.000	0.000	18.230

D. Acquisition Strategy

Multi-Mission Signal Processor (MMSP) provides AAW/BMD Multi-mission capability for Aegis Modernization Program and leverages BMD 4.0.1 and SPY-1D(V) designs. This MMSP development efforts will lead to the OPN procurement for sites and shipsets.

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3232: <i>Multi-Mission Signal Processor</i>

E. Performance Metrics

- Successfully complete MMSP CSEDS AEGIS Light Off
- Successfully complete MMSP Production Readiness Review
- Successfully complete SPY-1D(V) Performance Demo
- Successfully complete Multi-Mission Exercise
- Successfully complete CG Program Design Review
- Successfully complete Qualification Testing
- Successfully complete CG and DDG Deliveries
- Successfully complete CG Critical Design Review
- Successfully complete ACB14 Critical Design Review
- Successfully complete CG/DDG CSSQT
- Successfully complete CG Demo

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3232: <i>Multi-Mission Signal Processor</i>
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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SYSTEM ENGINEERING	SS/CPFF	Lockheed Martin Moorestown, NJ	0.000	28.019	Oct 2009	27.716	Dec 2010	0.000		27.716	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	Various/ Various	Various Various	0.000	4.451	Jan 2010	4.400	Dec 2010	0.000		4.400	Continuing	Continuing	Continuing
Subtotal			0.000	32.470		32.116		0.000		32.116			

Remarks

Management Services (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PSS	C/CPFF	TBD-PSS TBD	0.000	0.491	Jan 2010	0.491	Dec 2010	0.000		0.491	Continuing	Continuing	Continuing
Subtotal			0.000	0.491		0.491		0.000		0.491			

Remarks

	Total Prior Years Cost	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	32.961	32.607	0.000		32.607	

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3232: <i>Multi-Mission Signal Processor</i>

Fiscal Year	2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MMSP on Destroyers	CSEDS ALO 10		PRR 4		SPY1D(V) Demo 1	Performance Demo 1	MM Exercise 8		Qual Testing 1	DDG 53 Delivery 4														
MMSP on Cruisers									PDR 11	CG 62 Delivery 1			CDR 11	ACB14 CDR 4	CSSQT 7					Demo 5				

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3232: <i>Multi-Mission Signal Processor</i>
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Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
MMSP CSEDS AEGIS Light Off (ALO)	1	2010	1	2010
MMSP Production Readiness Review (PRR)	3	2010	3	2010
SPY-1D(V) Performance Demo	2	2011	2	2011
Multi-Mission Exercise	4	2011	4	2011
CG Program Design Review (PDR)	1	2012	1	2012
Qualification Testing	2	2012	2	2012
CG Delivery	2	2012	2	2012
DDG Delivery	3	2012	3	2012
CG Critical Design Review (CDR)	1	2013	1	2013
ACB14 CDR	3	2013	3	2013
CG/DDG CSSQT	4	2013	4	2013
CG Demo	3	2014	3	2014

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>				PROJECT 3301: <i>Improved Capabilities SPY-1 Radar</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3301: <i>Improved Capabilities SPY-1 Radar</i>	0.000	0.000	4.535	0.000	4.535	4.720	3.581	2.165	1.035	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification											
Improved Capabilities for SPY-1 Radar: These Reliability, Maintainability, and Availability (RM&A) improvements are intended to reduce Casualty Reports (CASREPs) and cascading failures, mitigate obsolescence issues, and improve reliability in support of Anti-Air Warfare (AAW) and Ballistic Missile Defense (BMD) missions; while still providing AN/SPY-1 Radar Total Ownership Cost Reductions. Improvements will yield reductions in annual fleet maintenance costs.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Improved Capabilities SPY-1 Radar <i>FY 2011 Base Plans:</i> - Initial Requirements development and design of 10 kW Traveling Wave Tube (TWT) and Continuous Wave Illuminator (CWI) Microwave Tubes							0.000	0.000	4.535	0.000	4.535
Accomplishments/Planned Programs Subtotals							0.000	0.000	4.535	0.000	4.535

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3301: <i>Improved Capabilities SPY-1 Radar</i>

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u> <u>Base</u>	<u>FY 2011</u> <u>OCO</u>	<u>FY 2011</u> <u>Total</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PE/LI: <i>BLI 2980/OPN Surface Warfare</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.700	1.500	7.600	10.000

D. Acquisition Strategy

Improved Capabilities SPY-1 Reliability, Maintainability, and Availability (RM&A) will design and development of an ORDALT Package for fixes and modifications to known transmitter, microwave tube (MWT), and logistic shortcomings (also includes the MK-99 CWI MWT).

E. Performance Metrics

- Successfully complete 10kW Traveling Wave Tube/Continuous Wave Illumination Microwave Tube (TWT/CWI MWT) Improvement Design/Development
- Successfully complete A/B E1 Switch Improvement Design/Development
- Successfully complete Cross-Field Amplifier/Switch Tube (CFA/SWT) MWT Improvement Design Development
- Successfully complete MWT Improvement Design/Development

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3301: <i>Improved Capabilities SPY-1 Radar</i>
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Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SYSTEM ENGINEERING	C/CPFF	Raytheon Sudbury, MA	0.000	0.000		1.905	Jan 2011	0.000		1.905	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	C/CPFF	Teledyne Sacramento, CA	0.000	0.000		0.907	Jan 2011	0.000		0.907	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	C/CPFF	CPI Palo Alto, CA	0.000	0.000		0.907	Jan 2011	0.000		0.907	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	NSWC/Crane, IN Crane, IN	0.000	0.000		0.816	Dec 2010	0.000		0.816	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		4.535		0.000		4.535			

Remarks

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	
		Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost				
Project Cost Totals		0.000		0.000		4.535		0.000		4.535		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3301: <i>Improved Capabilities SPY-1 Radar</i>
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Fiscal Year	2010				2011				2012				2013				2014				2015			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Improved Capabilities SPY-1 Radar																								

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 3301: <i>Improved Capabilities SPY-1 Radar</i>
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Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
10 kW TWT/CWI MWT Improvement Design/Development	1	2011	4	2012
A/B EI Switch Improvement Design/Development	1	2012	4	2013
CFA/SWT MWT Improvement Design Development	1	2013	4	2014
MWT Improvement Design/Development	1	2015	4	2015

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy **DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 9999: <i>Congressional Adds</i>
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COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	19.147	16.332	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.479
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Common Below Decks Affordable Architecture - Congressional Add is to develop a common digital sensor architecture and to develop supportability solution for deployed above water sensors (FY09).

National Radio Frequency R&D and Tech Transfer Center - Congressional Add for RF technology. RF technology for above water sensors is required to meet Navy Radar Program objectives. RF technology will be brought to a readiness level in preparation for insertion into manufacturing (FY09).

Advanced Sensor Development - Congressional Add to develop and demonstrate the technology required to sustain supportability solution for deployed above water sensors. Efforts to be performed will be in the technology development phase to include interpreting user needs and operational capabilities, developing system performance and limitation specification, developing functional definitions for technologies, demonstrate system functionality, demonstrate integrated system, and demonstrate and validate systems concepts and technology maturity (FY09/FY10).

Common Display Sensor Architecture - Congressional Add to execute the AN/SPS-49A(V)1 common digital sensor architecture transmitter modification from system functional requirements to preliminary design review. This shall include - developing prototypes to reduce integration and manufacturing risks; ensure operational supportability; reduce the logistics footprint; and implement human systems integration (FY10).

Submarine Navigation Decision Aids - Congressional Add to continue the SBIR effort in support of the fielded AN/BPS Radar VMS Subsystem. With the implementation of ECDIS-N on submarines, there is a need to improve related navigation functions which are not currently supported in navigation architectures afloat, referred by the fleet as Navigation Decision Aids (FY10).

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010
	0.000	2.390

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 9999: <i>Congressional Adds</i>
B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
Congressional Add: Common Digital Sensor Architecture <i>FY 2010 Plans:</i> N/A		
Congressional Add: Submarine Navigation Decision Aids <i>FY 2010 Plans:</i> N/A	0.000	3.983
Congressional Add: Common Below Decks Affordable Architecture <i>FY 2009 Accomplishments:</i> N/A	3.191	0.000
Congressional Add: National Radio Frequency R&D and Tech Transfer Cen <i>FY 2009 Accomplishments:</i> N/A	3.989	0.000
Congressional Add: Advanced Sensor Development <i>FY 2009 Accomplishments:</i> N/A <i>FY 2010 Plans:</i> N/A	11.967	9.959
Congressional Adds Subtotals	19.147	16.332

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604501N: <i>Advanced Above Water Sensors</i>	PROJECT 9999: <i>Congressional Adds</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
D. Acquisition Strategy N/A		
E. Performance Metrics Congressional Add.		

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